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The Foreman

By HOLLIS GODFREY, Sc.D.

President, Drexel Institute, Philadelphia, Pa.

MUCH has been done in the way of engineering surveys of industrial plants. Some of the methods employed were good; others were bad. All good and bad alike failed to take into consideration the human problem. They dealt only with machines and material. It has been well said that every labor law and labor organization is a monument to somebody's blunder, somebody's lack of foresight, somebody's faulty sense of justice.

Any plan that does not link men with machines fails and it fails because back of the power must always be the mind. Nothing will do more in this period to aid in the development of both prosperity and capacity than to give to the craftsman the training required by a non-commissioned officer of industry and to train non-commissioned officers of industry for further advancement. "The squad is no better than its corporal," said a great general. We may paraphrase this remark by saying, "A group of workers is no better than its foreman." The foreman is primarily a community officer of an industrial community. He is the route man who makes the routes by which the goods travel and he is the public works department that keeps the shop clean. He is the teacher who teaches the citizen of his part of the community how to live and work effectively in that community. He is the public servant who, if he rightly performs his function is not concerned with controversies between employer and employe, being detached from both. In a properly organized plant his work involves no differences of opinion. He organizes men and material. He is essentially the sub-engineer who, because of his position, may inaugurate any change which an industrial survey shows necessary. The foreman is the one man to whom is necessarily entrusted the actual production of the goods and the actual training of the workers in his section. He must carry out the orders of the engineer or the planning department. He must understand those orders and know how to put them into effect. Therefore, the development of one of our last remaining resources—skill,

involves the training of the foreman or non-commissioned officer of industry. He must be fitted for the two essential tasks of every foreman—production engineering in which he acts as a sub-engineer and the training of the workers under him, which is essentially vocational teaching. What is set forth here involves no new material, but is based on the studies of the past.

The inauguration of a plan for bringing about profitable action through the use of capitalized experience involves two operations. First, collection of the best experience within a given plant obtained by an engineering survey. Second, combining the best experience within the plant with the best outside the plant and putting it into teachable form for use in the school for foremen. The first step in the development of the field of the plant is to visualize the processes inside the plant, with orders coming to the foreman, his transmission of those orders to the workmen, the bringing in of raw materials, its passage through the process of the departments and, finally, the getting out of the finished product. There are three great groups of experience that concern the foreman—the functions of men, what they do; the function of material, raw materials which pass through the machines and come out as a finished product; and, lastly, the function of the money which pays for the raw material and the process and thereby makes possible the profit from the product. All these are governed by the transmission of experience. Experience furnishes a chart by which the three are assembled to make goods and subsequently money, because it is the order given upon the basis of experience which causes all three to function.

With the collection, analysis and synthesis of the best experience within and without the plant, combined and capitalized, the next step of transmission to the worker through the foremen logically follows. The plan which I propose is to develop the foreman in such a way that he may become the agent of the management in any reorganization development and yet be a friend and counsellor of the worker. We should develop this asset of capitalized experience, in order to give the foreman the tool by which he may do his work, or, to use an analogy, the key by which he can unlock the door to the golden treasury of experience. For one hundred years our engineering colleges have been developing skill through the work of the engineer and giving the engineer

the key to unlock the door of his problem. For at least a quarter of a century the vocational schools have been working to give the worker a key to unlock the door of his problems, but the one man who can unite effectively the work of both the engineer and the worker has been neglected—the non-commissioned officer of industry. The plan proposed is designed to develop to a high degree the skill of the foreman in a plant and with that skill to gain increased profits and better service.

The plan is inevitably in two parts—the development of the training of the “leading hand” to become a foreman and the training of the foreman already in the plant.

I am going, first, to take up the training of the foreman already in the plant as this is the swiftest action that can be taken. What are the factors of production? Are they not directness of action, quality of action, reduction of waste, freedom of action for maximum development of skill, better service, increased earnings and balanced production? These are only developed through experience as applied to men, money and material. The engineer and the sub-engineer, that is the foreman, do not have to consider anything directly pertaining to finance except as they work on the reduction of cost. In a modern factory, the foreman does not have anything to do with the hiring or the firing of men, because that should be the work of the personnel employment department. He should be in an advisory relation and sit in with the personnel manager, but he should not do three jobs. He cannot hire and fire and be sub-engineer and the vocational teacher at the same time. Of course, the above does not apply to construction jobs where the only officer actually on the job is the foreman or sub-foreman. That condition exists on a construction job, but not in most industrial plants. There is nothing that so nags a foreman or interferes with the success of his job as to have to hire and fire. He must take the engineering job and turn it into material. He must take the design and struggle with it until he understands it. He must also teach the twenty, fifty or a hundred men under him. It is a waste of his time, if besides these vital duties he must also hire and fire. The foreman has everything to do with the organizing, assembling and transporting of materials and the teaching and assembling of the powers of the men within the plant. For that reason there is a complete separation between

the training of the ordinary engineer and the sub-engineer or the foreman. The engineer must be able to design, instruct and supervise. The foreman does not have to design or does not have to know outside practice, but he must be able in the shortest and most effective way to carry on the broad design. It should also be made possible for him so to add to his knowledge that in time he may take the "sub" from his title. It is, therefore, necessary to set forth specifically what must be done to enable the non-commissioned officer of industry to become first a productive engineer and second, a vocational teacher. First, he must have records of the experience of the plant where he works, coördinated for his use. Second, he must have them so expressed that he can transfer orders based on the experience to the worker. Third, he must have the plan so analyzed that he can get balanced production—that assembly of material which will come together at the right time and in the shortest time. All these things are a part of necessary engineering knowledge. Unless they are furnished him in a form as simple and as direct in comparison to the needs of his group as is an engineering handbook to the needs of the engineer, the foreman will not be able to carry out his function. The foreman's work is primarily that of the shop and his experience must comprise a practical, personal knowledge of the four walls in which he studies, of the machines which he sees, and of the men with whom he works. Even if he has all these things, there are three other things which he must have in order to train his men. He must have the experience which he is to use expressed in terms of the worker, so that he can train any worker no matter what his language or power of understanding may be. He must be able to take the experience which he requires and transmit it in the shortest possible time using the swiftest means of attack upon the problem confronting him. Last and by no means least, he must collect the new valuable experience which results from any action, and turn it back to the engineer of design to aid him in new plans and in new methods of control.

How can these six things be given to the foreman who is the worker and who is working even in this hour in darkness and without a thorough knowledge on his part of the great scheme of production or how to transmit that which he does know to the worker? It can be done in the same way that the knowledge

which was needed by the engineer was collected and given to him; the only difference being, that the experience which the foreman must have is that of the specific plant. The experience which is now on scraps of paper, in operation orders, inspection orders and other records of that nature, subject to loss by death or misplacement, must be brought together, analyzed and synthesized. The best must be extracted from the whole and the unprofitable material discarded. It must be so expressed that the foreman himself can use it, and use it within narrow limits of time and space. It must be balanced so that the experience which comes from one group will not clog production and so that no experience which is used in any way can cause loss of time, energy or money. The only way by which this can effectively be done is by having a trained engineer handle it, make a complete engineering survey of the plant, analyze the material which the foreman must use, combine it with the best outside experience, record it in simple terms which can be understood and balance it by known methods of scientific analysis and synthesis. With the completion of the first function of the engineer analyst the school may be begun, for it will have then been determined just what the non-commissioned officer of industry should know about his plant and what he should know of general subjects.

The next task is the organization and operation of the school for non-commissioned officers and "leading hands." It is in the teaching—difficult as this is—that some progress has been made, but there are almost no factories where any of the wonderful unused teaching powers of the foreman have been developed. To develop these, we must take advantage of the advances in education, which have been as swift during the war as the advances in engineering analysis. Today, we can use in peace, the same methods by which in war we trained hundreds of thousands of men for the army, navy and supporting industries. We can use the swift methods of expression, of transmission and of collection which we learned in war. In order to put such a plan as this into effect, it becomes necessary to take a single plant, analyze it, and express it in terms which a non-commissioned officer can use and understand. To do this one addition is necessary to any plant. There must be established an Experience Division with a teaching room for the foremen, which gives to them the charts of their course as they give the blue-print and tool-list to the workmen. As I write this

I sit on the deck of a coastwise steamer which has been run on the shoals off Cape Cod. It seems to me this instance serves as a very good analogy. The captain of the ship as well as the foreman must have experience. However, he cannot depend upon his own experience alone. He must have charts, bouys and lighthouses which are the product of experience of others. Furthermore, he must be taught how to use that experience effectively. The captain in this case, recently out of a training school, had the experience material before him, but had not been taught how to use it in the best way. The result was a loss of time, energy and money. When the Experience Division and teaching room are added you have the man who uses the tool and you have the tool itself which is the use of capitalized experience. You have the means by which the man is to get the tool—an Experience Division, charged with the function of carrying out the best knowledge, derived from each group of war-time industries.

There are no special difficulties in the introduction of such a plan. I may say here, that I have talked to many labor leaders about this question of education of the foreman and I have never found any leader or foreman who made the slightest objection to it. There are no objections because there is not a selfish element in it. It is the one plan which makes the interest of capital and labor one. It is the one link which is needed to fill that existing gap in an industry so that we may all serve to a maximum degree, the nation, our associates and ourselves. It is a primer lesson in citizenship.

What are the results? First, it gives the plant managers a basis on which to act in their development in any plant reorganization. Second, it makes every foreman an intelligent assistant manager and sub-engineer. He is enlightened. He no longer looks upon his one department as his world, but he has gained a broad knowledge of business. His versatility as well as his breadth has been increased. Heretofore, all changes in a plant were the arousing signal for suspicion and controversy. By enlightening the foreman we have the entering wedge by which new methods may easily be introduced. We have established a link between employer and employe. In his new place and with his new interest the foreman is stimulated and in turn stimulates and arouses the interest of the worker.